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ANTI-GAS FEEDING BOTTLE

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(57) Claim

1. A teat for use with a baby feeding bottle, said teat comprising a thicker or harder nipple portion adjacent a slit cut outlet of said teat such that said teat slit cut outlet is substantially prevented from opening when squeezing the thicker or harder nipple portion unless the baby is sucking, said teat having an annular base portion which is adapted to be received within a cap having an aperture therein such that said teat protrudes from said cap, wherein said teat has a relatively smaller nipple protruding from said annular base portion, said nipple protruding when in use into said feeding bottle and having a slit cut therein such that air is able to pass through the slit cut in said nipple in said annular base portion when in use.

ANTI-GAS FEEDING BOTTLE

This invention relates to feeding bottles for babies. More particularly, the invention relates to means for providing an anti-gas feeding bottle to assist in the prevention of the babies suffering colic, choking, vomiting and hiccupping due to intake of gas during feeding.

BACKGROUND OF THE INVENTION

Many babies suffer from colic, choking, vomiting and hiccupping due to intake of gas during feeding from bottles. The causes are numerous but the main cause of such problems is the intake of air from the feeding bottle. When the mother is feeding the baby from a bottle, the mother should ensure that the bottle is held at the appropriate angle to prevent air or gas entering the teat by ensuring that the teat is always fully filled with the liquid feed formula.

When the baby is self feeding, the chances of air entering the teat of the bottle is increased and therefore the problem is greater. It is seen that it is not always in the best interests for the baby to self feed as the presence of the gas in the teat can lead to the increased chances of the problem of colic etc.

A known inner tube set is used with conventional feeding bottles and teat to feed babies. The inner tube set consists of a flexible tube with a heavy ball having an aperture therein attached to its free end. The ball is heavy enough that it always sits in the liquid inside the bottle no matter how much liquid is in the container and at which angle the bottle is held. The other end of the tube is fixed to a projecting vent of an annular disc fitted to the top opening of the bottle to which the teat is attached. In use, the liquid is sucked into the teat by the baby via the inner tube and the projecting vent. As the ball always sits in the liquid, no gas is introduced into the teat from within the interior of the bottle while feeding. However because the air pressure in the bottle is normally lower during feeding, air is drawn into the teat and the tube between each suck via the teat.

A conventional slit cut outlet of the teat can seal itself to stop air entering via the slit cut outlet. However it has been found when using a slit cut teat that a relative substantial amount of air is still introduced into the teat and part of the inner tube.

The air that partially or wholly fills the teat and inner tube is taken in from the teat and inner tube by the baby before the liquid can be obtained. This means that the baby has to swallow a substantial amount of air which causes colic etc while using the tube set.

Therefore it is clear that using the inner tube set even in combination with a conventional slit cut teat does not provide an anti-gas function.

It has been found that there are two reasons to cause air intake via the slit cut teat. The first reason is the action of the baby's mouth on the nipple of the teat whilst feeding. The baby does not always suck but also bites and squeezes the nipple. When the slit cut outlet is opened by biting or squeezing without sucking, the air enters the teat and inner tube.

The second reason is there are no efficient air inlets to quickly balance the air pressure inside and outside the feeding bottle. While the liquid is ingested by the baby, the air pressure inside the feeding bottle becomes lower than that outside. This can cause the slit cut outlet to open.

Meanwhile, the lower the air pressure inside the bottle, the greater the pressure differential thus air is sucked into the teat via the slit cut outlet whether the baby bites or squeezes the nipple or not. On the other hand, the baby will bite and squeeze the nipple by instinct if sucking the liquid becomes difficult due to lower air pressure inside the bottle.

Another problem associated with baby feeding bottles is the difficulty in screwing the cap on with the optimum pressure. If not enough pressure is exerted between the cap and the teat, the liquid within the container will leak out, while if too much pressure is exerted by the cap on the teat, then the container will be sealed with an airtight seal and air will not be able to enter the container to equalise the pressure inside which is reduced as liquid is sucked out by the baby.

OBJECT OF THE INVENTION

It is therefore an object of the invention to provide a teat and an arrangement to substantially overcome the above mentioned problems by combining with a conventional feeding bottle and a conventional inner tube set to operate as an anti-gas feeding bottle.

DISCLOSURE OF THE INVENTION

According to one aspect of the present invention there is disclosed a teat for use with a baby feeding bottle, said teat comprising a thicker or harder nipple portion adjacent a slit cut outlet of said teat such that said teat slit cut outlet is substantially prevented from opening when squeezing the thicker or harder nipple portion unless the baby is sucking, said teat having an annular base portion which is adapted to be received within a cap having an aperture therein such that said teat protrudes from said cap, wherein said teat has a relatively smaller nipple protruding from said annular base portion, said nipple protruding when in use into said feeding bottle and having a slit cut therein such that air is able to pass through the slit cut in said nipple in said annular base portion when in use.

Preferably, the thicker or harder nipple portion can include an insert of harder material in the material of the teat. Alternatively, the thicker or harder nipple portion can include an inner or outer sleeve of harder material applied to the teat.

According to another aspect of the present invention there is disclosed a teat and cap device for use with a baby feeding bottle container having an open end, said device comprising a teat made of resilient flexible material having an annular base portion which is adapted to be received within a cap having an aperture therein such that said teat protrudes from said cap, an inner tube being fixed at one end to an annular disc which is receivable at the open end of said container to block said open end when so received whereby said tube communicates with the interior of said teat through aperture in said annular disc, an inlet means located at a free end of said tube within said container, said inlet means being heavier than the inner tube such that it moves due to the force of gravity within said container to be positioned within said liquid in said container when in use, wherein said teat has a relatively smaller nipple protruding from said annular base portion, said nipple

protruding when in use into a vent opening in said annular disc and having a slit cut therein such that air is able to pass through the slit cut in said nipple in said annular base portion of said teat into the interior of the container

Preferably, the teat comprises a thicker or harder nipple portion adjacent the slit cut portion of the teat.

According to another aspect of the present invention there is disclosed a teat and cap device for use with a baby feeding bottle container having an open end, said device comprising a teat made of resilient flexible material having an annular base portion which is adapted to be received within a cap having an aperture therein such that said teat protrudes from said cap, an annular disc which is receivable at the open end of said container to block said open end when so received whereby an aperture in said annular disc communicates between the interior of said teat and the interior of said container, wherein said teat has a relatively smaller nipple protruding from said annular base portion, said nipple protruding when in use into a vent opening in said annular disc and having a slit cut therein such that air is able to pass through the slit cut in said nipple in said annular base portion of said teat into the interior of the container.

According to a still further aspect of the present invention there is disclosed a teat arrangement for use with a baby feeding bottle, said teat arrangement comprising a first outer nipple portion with a slit cut outlet of said teat with said teat being adapted to be fitted to said baby feeding bottle with an annular disc having an opening therein being positioned between said teat and the container of said bottle, and an internal nipple with a slit cut opening being adapted to be fitted to the opening such that said internal nipple is located within said teat.

BRIEF DESCRIPTION OF THE DRAWINGS

Some embodiments of the present invention will now be described with reference to the drawings in which:

Fig. 1 is a cross sectional view of an anti-gas feeding bottle of a preferred embodiment;

Fig. 2 is a perspective view of the teat of the anti-gas feeding bottle of Fig. 1;

Fig. 3 is a perspective view of the inner tube set and annular disc of the anti-gas feeding bottle of Fig. 1;

Fig. 4 is a cross sectional view of a teat of another preferred embodiment;

Fig. 5 is a cross sectional view of a teat of a further embodiment;

Fig. 6 is a perspective view of an insert which is located in the teat of Fig. 5;

Fig. 7 is a cross sectional view of a teat of a still further preferred embodiment;

Fig. 8 is a perspective view of an insert which is located in the teat of Fig. 7;

Fig. 9 is a cross sectional view of a teat of a still further preferred embodiment;

Fig. 10 is a cross sectional view of a teat of a still further preferred embodiment;

Fig. 11 is a cross sectional view of a teat of a still further preferred embodiment;

Fig. 12 is a partial cross sectional view of a feeding bottle of a still further embodiment.

BEST MODE OF CARRYING OUT THE INVENTION

An anti-gas baby's feeding bottle 10 of a preferred embodiment is illustrated in Fig. 1 of the drawings. The bottle 10 includes a container 11 having an open end 12 onto which a cap 13 with protruding teat 14 are screwed thereon.

A flexible inner tube 15 is fixed at one end to an annular disc 16 which is received at the open end 12 and clamped into position by the screwing action of the cap 13. An annular rib 17 on the lower surface of the disc 16 is used to fit the disc 16 to the container 11. The

inner tube 15 is fixed to an internal flange 18 and is open at this end and therefore communicates with the interior of the teat 14 so that liquid can pass through this opening 19. The annular disc 16 also has an outer annular flange 20 to assist in the clamping of the teat 14 into the correct position as described below. An arcuate slot vent 21 is located in the disc 16. This vent 21 is preferably arcuate in shape but can take any appropriate form.

The teat 14 has an annular flange portion 22 with a small nipple 23 protruding downwardly therefrom in the opposite direction to the teat 14 and into the arcuate slot vent 21. The slot vent 21 is arcuate so that the nipple 23 always fits into the vent 21 even after the cap 13 is tightened. The small nipple 23 has a slit cut 24 in its end to allow air to pass therethrough. As seen in Fig. 2, a groove 25 is located in the top side of the annular flange portion 22 to allow greater access for the air to travel into the small nipple 23.

The cap 13 has a top portion 26 having a circular opening 27 centred therein through which the teat 14 protrudes. A depending skirt 28 with an internal thread 29 is used to fit the cap to an external thread 30 on the neck of the container 11.

When the cap 13 is fitted to the container 11, the disc 16 is seated at the opening 12 with the teat 14 fitted into the cap 13 with the annular flange portion 22 being received within the cap 13 with a side portion 31 abutting against the opening 27 of the cap 13 and an annular lip 32 adjacent the side portion 31 abutting against the top portion 26 to maintain the teat 14 in position. When the cap 13 is being applied to the container 11, the inside surface of the side portion 33 of the teat 14 abuts against the outer annular flange 20 of the annular disc 16. The cap 13 seals the soft flexible material of the teat 14 against the annular disc 16 to prevent the leaking of liquid from the container 11. The seal caused is not airtight as air needs to be able to pass into the container 11 via the space between the opening 17 in the top 26 of the cap 13 and the outside surface of the teat 14. The screw threads 29,30 also provide a seal in their usual way. The air can enter the small nipple 23 through the space as described above with the groove 25 assisting to make the path easier.

An inlet ball 35 having an opening 36 is located at the free end of the tube 15 and is relatively heavy as it is preferably made from stainless steel. Therefore the inlet ball 35 due to the flexible nature of the tube 15 and its relative weight is acted upon by the gravitational

forces to always be posit d within liquid which is in the contai l The inlet ball 35 is free to move around within the container 11 to ensure that air does not enter the tube 15 via the inlet ball 35 which is located within the container 11

The teat 14 has a thicker portion 37 adjacent its nipple end 38 in which a slit cut outlet 39 is located. The slit cut 39 can be one of a cross cut, a slit cut, a Y cut, a T cut or any appropriate slit cut which closes when the nipple 38 is at rest and not being used. The size and shape of the thicker portion 37 as seen in the drawings can be varied with the criterion being the balance of efficiently stopping the baby from squashing the teat 14 and the baby's oral comfort. The dimension of the slit cut outlet 39 corresponds to the internal diameter of the thicker portion 37 of the nipple end 38. The slit cut outlet 39 is as thick as normal and therefore has the resilience to seal itself as usual.

In the embodiments shown in Figs. 5-8, a ring 40 of harder material than the silicon or latex rubber of the teat 14 is inserted into the thicker portion. The materials and shape of the ring 40 can vary, however, the coefficient of expansion of the material of the ring 40 should be lower than that of the silicon or latex rubber of the teat 14.

It is also possible as illustrated in Fig. 11 that the thicker portion 37 be completely made from a harder material and therefore does not have to be substantially thicker than the rest of the teat 14 to achieve the same result.

Another method of achieving the same result is to place an internal sleeve 41 into the nipple end 38 of the teat as illustrated in Fig. 9. Another alternative is to provide an outer sleeve 42 as illustrated in Fig. 10 illustrated).

It has been found the provision of the teat 14 with the thicker or harder material at the nipple in combination with the smaller nipple 23 in the annular flange portion 22 and the inner tube arrangement ensures that the feeding bottle 10 operates as an anti-gas feeding bottle which prevents a substantial amount of air entering the interior of the teat 14 either by being received from the interior of the container 11 or from the action of the baby squashing the nipple with lower air pressure inside the feed bottle, allowing air to enter the teat from a cut nipple as used. The smaller nipple 13 allows air to enter the container 11 and

not the teat 14 when the pressure within the container is substantially less than outside air pressure. The use of the slit cut 24 in the small nipple 23 allows air to pass in one direction into the container 11 as well as preventing liquid to pass out from the container 11 via this small nipple 23. The sealing of the cap 13 is enough to prevent liquid leaking out but to allow air to pass into the container to equalise air pressure during the use of the feeding bottle 10.

The harder material in the nipple of the teat 14 also prolongs the life of the teat 14 which can be subject to severe distortion from the baby squashing the teat while trying to feed instead of sucking which is the optimum method of using known teats.

Another embodiment of the invention is illustrated in Fig. 12 with the feeding bottle 110 shown in a partial cross sectional view with a container 111 having an open end 112 onto which a cap 113 with protruding teat 114 are screwed thereon.

In this arrangement, the flexible tube arrangement is not shown but it can be used if desired but is optional. An annular disc 116 is shown received on the open end 112 of the container 111. The annular disc 116 has an annular rib 117 at its periphery so that it sits on top of the open end 112 of the container 111. An internal flange 118 is adapted to have a tube (not illustrated attached thereto with an opening 119 passing through the annular disc 16 at this flange 118. The disc 116 also has an outer annular flange 120 to assist in the clamping of the teat 114 in the correct position as described above in reference to the other embodiments.

In this embodiment, the annular disc 116 does not have any arcuate openings and the annular flange portion 122 of the teat 114 does not have any small nipple as previously described in the other embodiment. The teat 114 is clamped into place by the screw action of the cap 113 onto the container 111 with the screws 129,130 of the depending skirt 128 and the top portion 126 providing a substantial seal against leaking liquid but not the intake of air.

In this embodiment, a further annular flange 140 is located on the outside of the annular disc 116 but inside the teat 114. A internal nipple 141 is placed over the flange 140 thus

covering the opening 119 of the disc 116. The internal nipple 141 has a slit cut 142 arranged therein such that liquid can pass through the opening 119 and the slit cut 142 into the interior of the teat 114. The internal nipple also prevents air from passing from the interior of the teat 114 into the interior of the container 111 as air cannot pass through the slit cut 141 of the internal nipple 141 in that direction in substantial quantities to cause problems. Thus the internal nipple 141 can be used with or without the use of the harder or thicker portion of the nipple of the other embodiments and/or with or without the use of the small nipple in the annular flange portion of the teat.

It has been found that the embodiments of the present invention as described are useful when used in conjunction with a tube set as described to prevent air being ingested by the baby when feeding.

The foregoing describes only some embodiments of the invention and modifications obvious to those skilled in the art can be made thereto without departing from the scope of the present invention.

The claims defining the invention are as follows

1. A teat for use with a baby feeding bottle, said teat comprising a thicker or harder nipple portion adjacent a slit cut outlet of said teat such that said teat slit cut outlet is substantially prevented from opening when squeezing the thicker or harder nipple portion unless the baby is sucking, said teat having an annular base portion which is adapted to be received within a cap having an aperture therein such that said teat protrudes from said cap, wherein said teat has a relatively smaller nipple protruding from said annular base portion, said nipple protruding when in use into said feeding bottle and having a slit cut therein such that air is able to pass through the slit cut in said nipple in said annular base portion when in use.

2. A teat as claimed in claim 1 in combination with and cap device for use with a baby feeding bottle container having an open end, said device comprising said teat made of resilient flexible material having an annular base portion which is adapted to be received within a cap having an aperture therein such that said teat protrudes from said cap, an inner tube being fixed at one end to an annular disc which is receivable at the open end of said container to block said open end when so received whereby said tube communicates with the interior of said teat through aperture in said annular disc, an inlet means located at a free end of said tube within said container, said inlet means being heavier than the inner tube such that it moves due to the force of gravity within said container to be positioned within said liquid in said container when in use, wherein said teat has a relatively smaller nipple protruding from said annular base portion, said nipple protruding when in use into a vent opening in said annular disc and having a slit cut therein such that air is able to pass through the slit cut in said nipple in said annular base portion of said teat into the interior of the container.

3. A teat as claimed in claim 1 in combination with and cap device for use with a baby feeding bottle container having an open end, said device comprising a first outer nipple portion with a slit cut outlet of said teat with said teat being adapted to be fitted to said baby feeding bottle with an annular disc having an opening therein being positioned between said teat and the container of said bottle, and an internal nipple with a slit cut opening being adapted to be fitted to the opening such that said internal nipple is located within said teat

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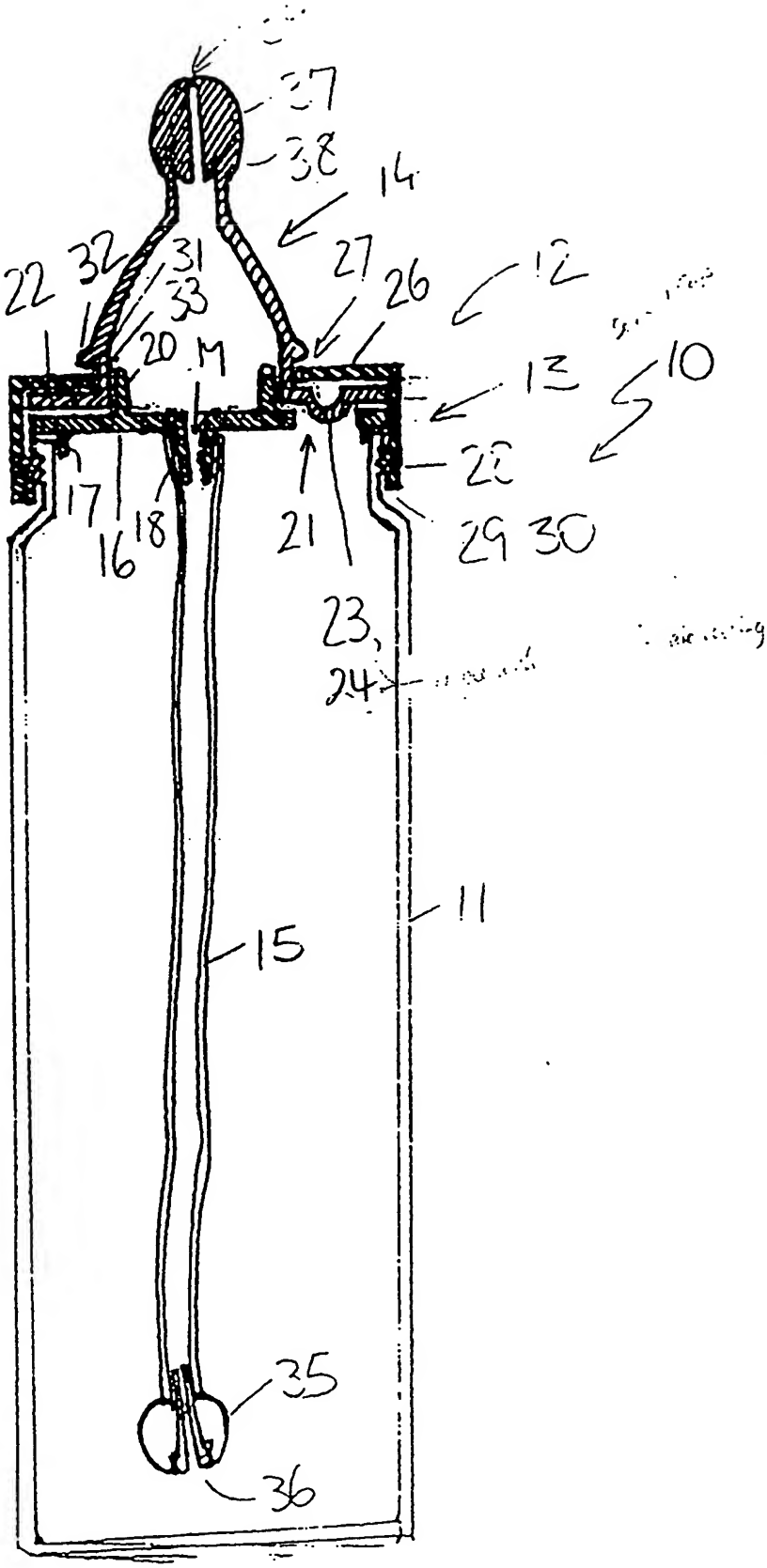
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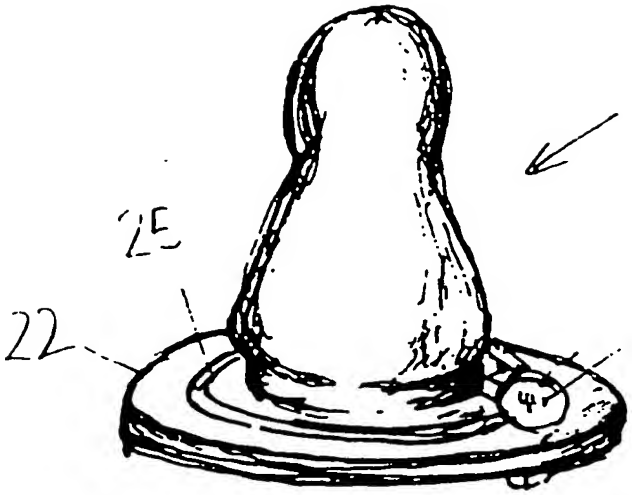
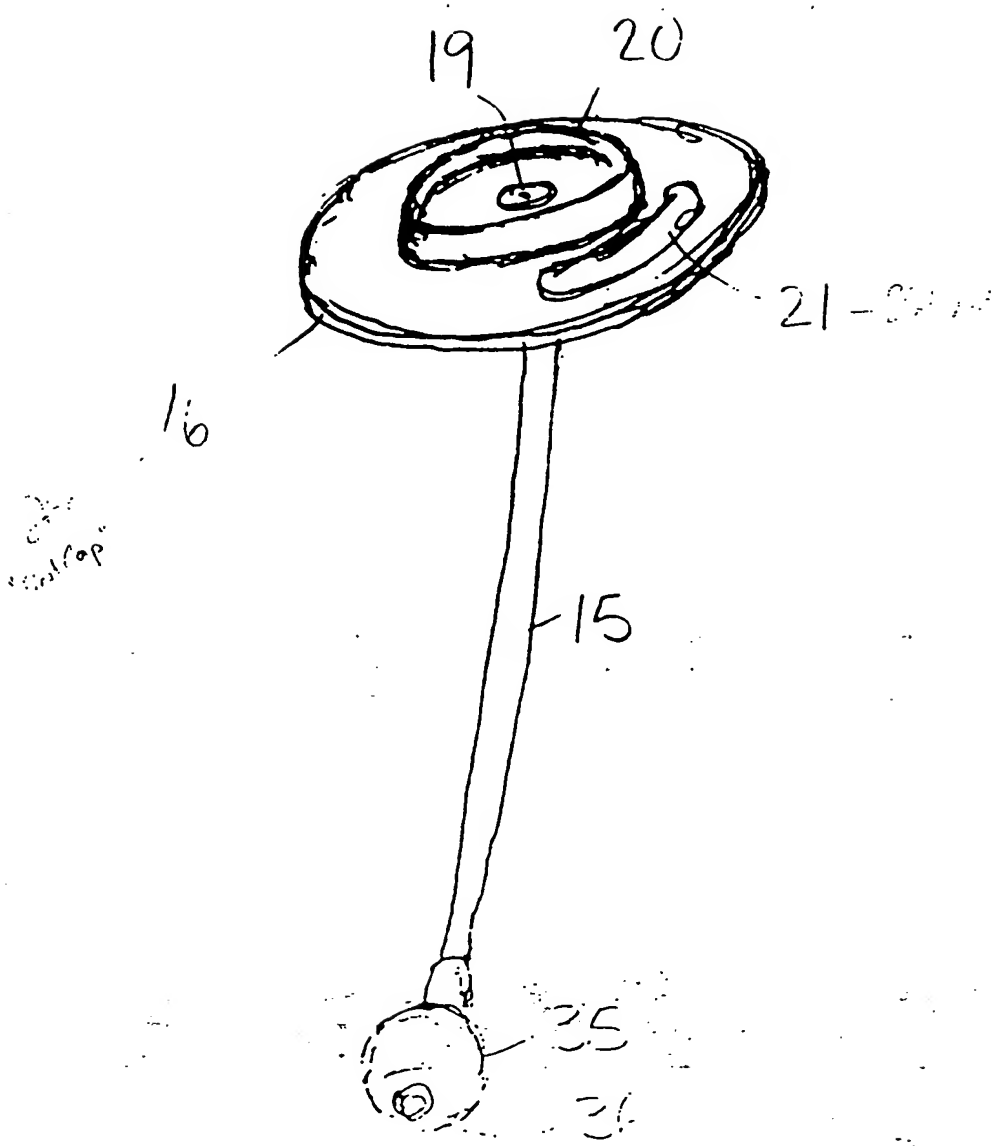
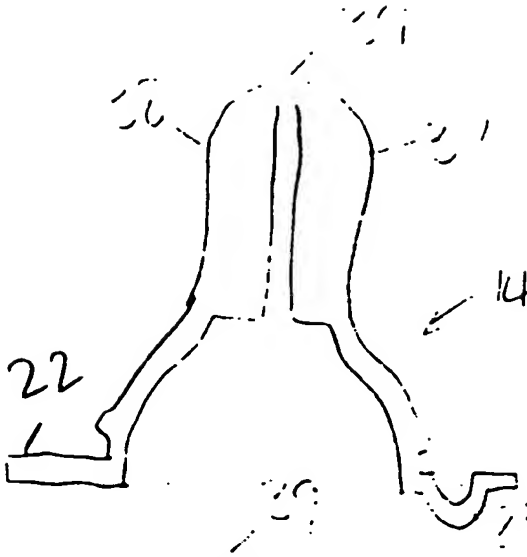


Fig 2





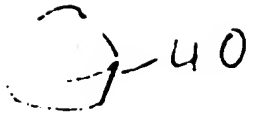


Fig 6

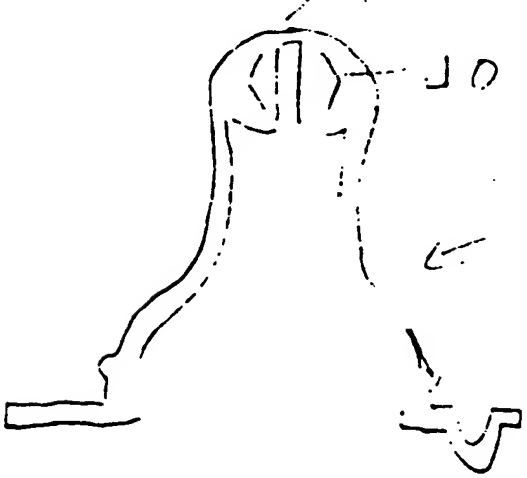


Fig 5

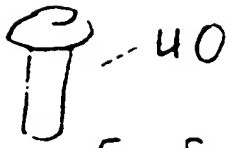


Fig 8

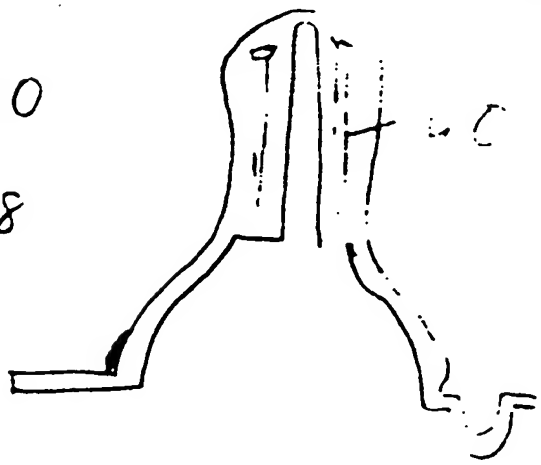


Fig 7

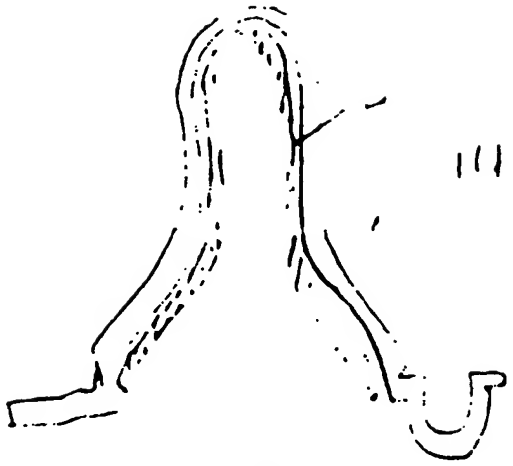


Fig 9

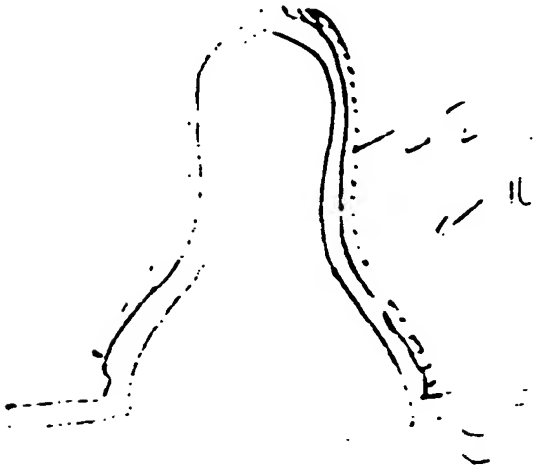


Fig 10

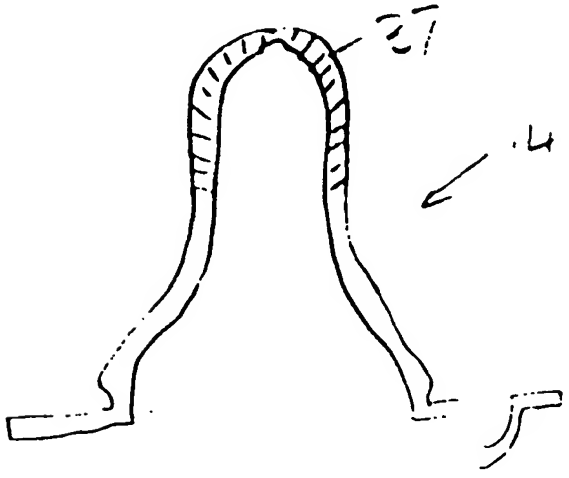


Fig 11

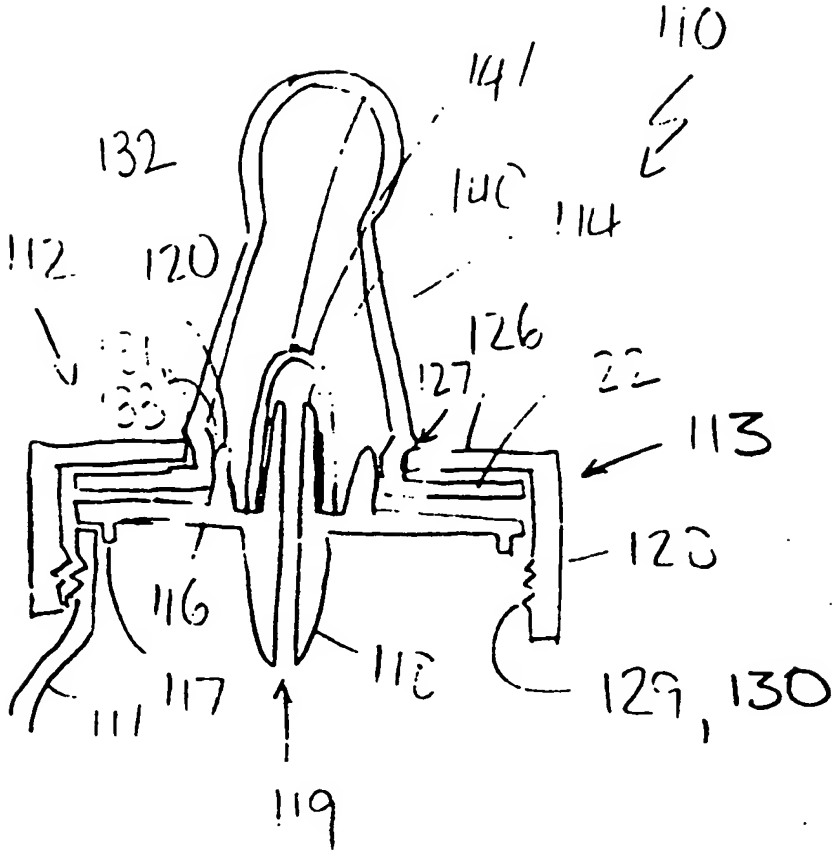

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Fig 12